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DEPARTMENT OF FISH AND GAME.

Jerry M. Conley, Director

FEDERAL AID IN FISH RESTORATION

Job Performance Report

Project F-71-R-12

REGIONAL FISHERIES MANAGEMENT INVESTIGATIONS

Job No. 2-a. Region 2 Mountain Lakes Investigations
Job No. 2-b. Region 2 Lowland Lakes and Reservoirs Investigations
Job No. 2-c. Region 2 Rivers and Streams Investigations Job No. 2-d. Region 2 Technical Guidance

By

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November 1988

TABLE OF CONTENTS

LIST OF TABLES

TABLE OF CONTENTS (Continued)

LIST OF TABLES

LIST OF TABLES (Continued)

Page

LIST OF FIGURES

LIST OF TABLES

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LIST OF TABLES (Continued)

LIST OF APPENDICES

LIST OF TABLES

JOB **PERFORMANCE** REPORT

State of: Idaho

Name: REGIONAL FISHERY MANAGEMENT INVESTIGATIONS

Project No.: F-71-R-12

Subproject No.: 2-a

Title: Region 2 Mountain Lakes Investigations

Period Covered: July 1, 1987 to June 30, 1988

ABSTRACT

Idaho Department of Fish and Game personnel interviewed anglers on 10 mountain lakes in Region 2 during 1987. The 33 anglers checked had fished 65 hours to catch 68 rainbow-cutthroat hybrids, 49 cutthroat and 44 rainbow trout. The overall catch rate was 2.5 trout per hour.

Basic survey information regarding species and size composition, spawning potential and relative angler use was obtained on 16 lakes within the Region during 1987.

Survey data was collected on 91 mountain lakes in the Selway River drainage during 1986-1987 as part of a cooperative program between the Idaho Department of Fish and Game and the Nez Perce National Forest. Methodology developed in the study will be applied to other lakes in the Region. Final data will be incorporated into a master of science thesis scheduled for completion in May 1989.

Author:

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OBJECTIVES

1. To evaluate the success of the mountain lake stocking program within the Region.

2. To monitor angler success and relative effort within selected lakes in the Region.

3. To collect data on spawning potential, species composition, fish condition and relative fish density. within selected lakes in the Region.

4. To develop indices of productivity and carrying capacity for mountain lakes.

RECOMMENDATIONS

1. Basic data collection as described in the objectives should continue on the mountain lakes within the Region.

2. Methodology developed from the Selway mountain lake studies should be applied at other lakes to better assess the stocking strategy at each individual lake. Questions to be answered include:

   a) Should the lake receive supplementation?

   b) What species should be stocked?

   c) What stocking rates per period of time will yield fish of a desirable size with catch rates of 0.5-1.0 fish/hour?

3. Terminate stocking in Ice Lake (North Fork Clearwater).

4. Initiate stocking in Scurvey Lake (Kelly Creek).

5. Maintain current stocking in Pete Ott, Ellie, Tillie, White Sand, Parachute, Duck, Jeanette and Rudd-Moore lakes.

TECHNIQUES USED

Much of the data obtained on mountain lakes in Region 2 during 1987 was collected by conservation officers. Each officer who has lakes within their district was assigned a group of lakes to survey. Management dollars were used for horse rental to visit the lakes.

Department personnel surveyed 16 different mountain lakes within the Region during 1987. Personal angling and angler interviews provided data on species and size composition, catch rates and fish condition.

Additional information was collected on spawning potential for assessing natural reproduction. Also, similar data was received from volunteer anglers who fished various lakes in the Region.

Survey data was collected on 91 mountain lakes in the Selway River drainage during 1986-1987 as part of a cooperative program between the Idaho Department of Fish and Game and the Nez Perce National Forest. Methodology developed in the study is described in Bahls and Stickney (1987). Final data will be incorporated into a master of science thesis scheduled for completion in May 1989.

FINDINGS

Lake Surveys

Pete Ott Lake

Pete Ott Lake is located at the headwaters of Pete Ott Creek in the North Fork Clearwater drainage. The lake has been stocked with various strains of cutthroat trout at approximately three-year intervals, except in 1980 when it was stocked with rainbow. It was last stocked in 1985 with 2,000 westslope cutthroat fry. The September 6, 1987 survey revealed medium densities of both rainbow and cutthroat. The rainbow ranged from 203-318 mm (8-12.5 in), while cutthroat ranged from 229-280 mm (9-11 in). Fish are in excellent condition. No catch rate information was collected. Access is good and angler use is heavy, with an estimated 40 people at the lake over the 1987 Labor Day Weekend. There is no spawning habitat available at this lake. The current stocking regime should be maintained.

Ice Lake

Ice Lake is located at the headwaters of Elizabeth Creek in the North Fork Clearwater drainage. The lake has been stocked with cutthroat at approximately three-year intervals and was last stocked with 1,000 westslope cutthroat in 1985. This lake also supports a naturally reproducing population of brook trout. The August 10, 1987 survey revealed a high density of 6-8 inch brook trout and a low density of 9 inch cutthroat. Cutthroat spawning occurs in the inlet, and fry were observed on the date of the survey. Catch rate on the day of the survey averaged 6.5 trout per hour. Fish were in good condition. The surveyor recommended no further stocking of cutthroat.

Tillie Lake

Tillie Lake is located in the Elizabeth Creek drainage of the North Fork Clearwater. The lake has been stocked periodically with cutthroat and was last stocked with 1,000 westslope cutthroat in 1985. The September 6, 1987 survey revealed a medium density of 12 inch cutthroat.

Catch rate on the day of the survey averaged 1.0 trout per hour. Fish are in good condition. The current stocking regime should be maintained. There is no trail to the lake, and angler use is rated as light.

Ellie Lake

Ellie Lake is also located in the Elizabeth Creek drainage of the North Fork Clearwater. The lake has been stocked periodically with cutthroat and was last stocked with 1,000 westslope cutthroat in 1985. The September 6, 1987 survey revealed a medium density of 12 inch cutthroat. Catch rate averaged 1.0 trout per hour; fish are in good condition. Access is steep and rough, and angler use is rated as light. No spawning habitat exists at this lake. The current stocking should be maintained.

Scurvey Lake

Scurvey Lake is located at the head of Scurvey Creek, which is a tributary to Kelly Creek in the North Fork Clearwater drainage. This lake has not been stocked, as it was previously thought to be too shallow to support fish. However, the July 25, 1987 survey indicated a depth of at least 15 feet. The lake is spring fed, and aquatic insects and frogs were abundant. The surveyor recommended stocking with 1,000 westslope cutthroat trout.

White Sand Lake

This lake is located at the headwaters of White Sand Creek in the Lochsa drainage. It has been stocked periodically with rainbow trout fry, and was last stocked with 2,000 rainbow in 1985. The August 12, 1987 survey revealed a low density of rainbow trout of all size classes up to 14 inches. Fry were observed in the inlet, indicating that some natural reproduction occurs in this lake. The larger rainbow were rated in fair condition with larger than normal heads. Angler use is rated light. the current stocking regime should be maintained.

Parachute Lake

This lake is located at the head of White Sand Creek in the Lochsa drainage. It has been stocked periodically with both cutthroat and rainbow over the years, but only with rainbow since 1981. The last stocking was 2,000 rainbow in 1986. The August 23, 1987 survey revealed a medium density of 12-18 inch rainbow. There is no spawning habitat available. Angler use is rated as light. The current stocking regime should be maintained.

Duck Lake

Duck Lake is located at the head of Duck Creek, which is a tributary to Big Sand Creek in the Lochsa drainage. It has been stocked every third year with cutthroat, except in 1980 when rainbow trout were stocked. The last stocking consisted of 1,000 westslope cutthroat in 1985. The August 2, 1987 survey revealed medium densities of both cutthroat and rainbow. The cutthroat were 10-12 inches, while rainbow ranged from 15-18 inches. Fishing was rated as good (3-4 trout per hour) on the survey date, and fish are in excellent condition. There is no spawning habitat here. Angler use is rated as moderate. The current stocking regime should be maintained.

Jeanette Lake

This lake is located at the head of Jeanette Creek which is a tributary to the East Fork of Moose Creek in the Selway drainage. It has been stocked periodically with cutthroat and was last stocked with 1,000 westslope cutthroat in 1986. The 1987 survey revealed that this lake is shallow and could easily winter-kill. No fish were seen. Angler use is light.

California Lake

This lake is located at the head of California Creek, a tributary to Fish lake Creek in the Lochsa drainage. The lake supports a naturally reproducing population of cutthroat trout. The August 23, 1987 survey revealed a high density of all sizes of cutthroat up to 14 inches. Catch rate on the survey date was very high. The fish caught were in good condition. Floating aquatic plants and submerged logs are abundant in this lake. Angler use is rates as light.

Fish Lake

This particular Fish Lake (one of three within Region 2) is located at the head of Fish Lake Creek in the Lochsa drainage. This lake supports a naturally reproducing population of cutthroat trout. The August 22, 1987 survey revealed a high density of 6 to 11 inch cutthroat. There is an airstrip at the lake, and angler use is rated as heavy.

Rudd-Moore Lakes

These lakes are located in the Spruce Creek drainage, a tributary to Brushy Fork Creek in the Lochsa drainage. Both have been stocked periodically with different strains of cutthroat trout and were last stocked with 1,000 westslope cutthroat each in 1987. In 1981, both were stocked with 1,000 RB x CT hydrids. The August 19, 1987 survey revealed a high density of 7-11 inch cutthroat in the lower lake and a medium density of cutthroat and low density of large RB x CT hybrids in the upper lake.

The hybrids caught in the upper lake were 15-17 inches long and in excellent condition. Catch rate on the survey was in excess of 10 trout per hour.

Burnt Knob Lakes

The three Burnt Knob lakes are located at the headwaters of Burnt Knob Creek, which is a tributary to the Little Clearwater River in the Selway drainage. The upper and lower lakes have been stocked periodically with either cutthroat, rainbow or RB x CT hybrids. They were last stocked with 1,000 westslope cutthroat each in 1985. The middle lake supports a naturally reproducing population of brook trout and is not stocked. The September 30, 1987 survey of all three lakes revealed a high density of all size classes of brook trout up to nine inches in the middle lake, with the low densities of cutthroat in the other two lakes. Angler use was rated as moderate at all three lakes. Current stocking regimes for the upper and lower lakes should be maintained.

Angler Census

Department personnel interviewed anglers at 10 mountain lakes in Region 2 during 1987. The 33 anglers checked had fished 65 hours to catch 161 trout for **an** overall catch rate of 2.5 fish per hour (Table 1). Their catch consisted of 42.21 rainbow-cutthroat hybrids, *30.4%* cutthroat and *27.4%* rainbow.

Table 1. Summary of mountain lakes creel census in Region 2, 1987.

Body of water	Month	Number of anglers checke	Fish caught			Total hours	Fish/ hour	Fish/ angler
			WR	CT	RB x CT hybrids			
Wildhorse	Aug	9	4	8	--	19.0	0.6	1.3
Lake Creek #1	Jul	4	--	20	--	4.0	5.9	5.0
Lake Creek #2	Jul	3	10	--	20	3.0	10.0	10.0
Lake Creek #3	Jul	6	--	--	8	6.0	1.3	1.3
Rattlesnake	Jul	4	--	--	40	6.0	6.7	10.0
Parachute	Jul	3	27	1	--	18.0	1.6	9.3
Shelf	Jul	1	--	4	--	0.5	8.0	4.0
He-Devil	Jul	1	1	7	--	4.0	2.0	8.0
Triangle	Jul	1	2	9	--	3.0	3.6	11.0
Baldy	Jul	1				1.0	0.0	0.0
TOTAL		33	44	49	68	65.0		

JOB **PERFORMANCE** REPORT

State of: Idaho Project **Name: REGIONAL FISHERY MANAGEMENT INVESTIGATIONS**

No.: F-71-R-12

Subproject No.: 2-b **Title: Region 2 Lowland Lakes and Reservoirs Investigations**

Period Covered: July 1, 1987 to June 30, 1988

ABSTRACT

Angler effort and catch estimates were made on four lowland lakes in Region 2 during 1987. Estimated total angler efforts were: 44,587 hours at Winchester Lake, 39,835 hours at Spring Valley, 20,313 hours at Manns Lake and 12,514 hours at Soldiers Meadow. Effort per acre was highest at Spring Valley (752 hours) and lowest at Soldiers Meadow (124 hours). Catch rates ranged from 1.14 trout per hour at Spring Valley to 0.74 trout per hour at Winchester Lake. Returns of $5.00 reward tags ranged from 29% at Soldiers Meadow to 55% at Winchester.

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OBJECTIVES

1. To estimate the angler effort, harvest and return to the creel of fish released into Spring Valley, Winchester, Soldiers Meadow and Manns Lake.
2. To assess the efficiency of the trout stocking program in the lowland lakes within the Region.
3. To establish guidelines for stocking catchable and fingerling trout into the lowland lakes within the Region.
4. To assess the status of largemouth bass and crappie introductions into Manus Lake and smallmouth bass introductions into Elk Creek Reservoir.

RECOMMENDATIONS

1. Stock catchable trout into the Region 2 lowland lakes as described in Table 1. For the best use of catchables, stocking rates need to be adjusted to effort. Obviously, those systems with the most effort will return the largest harvest, given similar catch rates. Because of the high exploitation, especially early in the season, the turnover time can be short. Catchable trout should be stocked in those high effort lakes at least once a month or, if practical, once every three weeks.
2. Continue creel surveys in 1988 to evaluate return to the creel and condition of marked Kamloops that were released into selected lowland lakes in the fall of 1987.
3. Continue creel surveys in 1988 in Waha, Manus and Moose Creek reservoirs to assess angler participation and harvest in the bass fisheries. Assess compliance with the 12 inch minimum size regulation.
4. Assess the effects of winter drawdown on aquatic macrophyte control in Elk Creek Reservoir. Continue releasing smallmouth bass into the reservoir.
5. Evaluate possible alternatives for controlling aquatic macrophytes in Moose Creek Reservoir.
6. Continue searching for additional reservoir sites in the Region.

Table 1. Recommended stocking rates of catchable trout for the Region 2 lowland lakes.

Lake	Surface Area (acres)	Total stocking rate (no./acre)	Total Released* Released*
Spring Valley	53	800	42,500
Winchester	85	600	51,000
Manns	145	300	43,500
Soldiers Meadow	100	200	20,000
Moose Creek	50	200	10,000
Elk Creek	60	200	12,000
Waha	100	300	30,000
Blue	10	200	2,000
Campbells Pond	5	300	1,500
Lewiston Levee Ponds	5	300	1,500

*Lakes should be stocked monthly from April through June and in September or October. Stocking schedules during the summer period are dependent on surface water temperatures.

TECHNIQUES USED

Estimates of angler effort and harvest were obtained on Winchester, Spring Valley, Manns and Soldier Meadow reservoirs by conducting an expandable random stratified creel census. Angler counts and interviews were conducted on two weekdays and two weekend days per a two-week census interval. The census was conducted during the general season from April 25 through October 31, 1987.

At Winchester Lake, a total of 89 angler counts were made, 47 on weekend days and 42 on weekdays. Angler counts at Spring Valley totaled 48, with 23 on weekends and 25 on weekdays. At Manns Lake, 104 counts were made, with 50 on weekends and 54 on weekdays. Soldiers Meadow counts totaled 55, with 22 on weekends and 33 on weekdays.

Reward tags ($5.00 each) were placed on 350 hatchery rainbow which were distributed into the above mentioned lakes as follows: Winchester, Manns and Soldiers Meadow, 100 each; and Spring Valley, 50. Returns of these tags were used in evaluating exploitation of stocked hatchery catchables.

All lowland lakes in the Region were stocked periodically with hatchery catchable rainbow trout from April through October. Spokane-strain fingerling rainbow (101 per pound) were stocked in Winchester, Spring Valley and Manns Lake in March and April. Adipose-clipped domestic Kamloops rainbow (K1) were stocked in Winchester (3.3 per pound), Spring Valley (8.0), Soldiers Meadow (3.3), Waha (12.8) and Moose Creek reservoirs (12.8). Wild Kamloops (K2) were stocked in Dworshak (25.0) and Elk Creek reservoirs (25.7); these were also adipose clipped (Table 2).

Floating horizontal gill nets with variable mesh ranging from 12 to 76 mm bar measure were set overnight in Winchester and Manns Lake during the first week of October. Basic limnological data was collected on Winchester Lake in late July to monitor water temperature and dissolved oxygen problems. Similar data was also collected at Spring Valley Reservoir in early August.

FINDINGS

Lake and Reservoir Surveys

Winchester Lake

During the 1987 general fishing season, April 25 through October 31, anglers fished an estimated 44,587 hours to harvest 32,887 hatchery rainbow trout (0.74 trout per hour) and 16,810 brown bullhead (1.11 total fish per hour). Shore anglers fished 40,432 hours to harvest 29,027 trout and 16,810 bullhead (Table 3). Boat anglers fished 4,155 hours to harvest 3,860 trout (Table 4).

Table 2. Summary of fish releases in lowland lakes and ponds of Region 2, 1987.

Body of water	Date stocked	Species stocked	Number stocked	Pounds stocked	Fish/ pound
Winchester Lake	4/2	R4	8,580	3,300	2.6
	4/6	R4	975	300	3.2
	4/22	R4	100[a]	37	2.7
	4/23	R4	6,800	2,000	3.4
	4/29	SSRB	30,000[b]	297	101.0
	5/27	R4	5,120	1,600	3.2
	6/26	R4	4,970	1,400	3.5
	9/24	Ki	9,900[c]	3,000	3.3
	10/16	R4	2,000	1,000	2.0
Catchable subtotal			38,445	12,637	3.0
Fingerling subtotal			30,000	297	101.0
Spring Valley Reservoir	4/2	R4	6,240	2,400	2.6
	4/6	R4	5,525	2,700	3.2
	4/21	R4	11,700	3,000	3.9
	4/22	R4	54[a]	20	2.7
	4/29	SSRB	30,000[b]	297	101.0
	5/27	R4	5,120	1,600	3.2
	7/7	R4	5,220	1,800	2.9
	8/19	K1	14,800[c]	1,850	8.0
	10/1	R4	9,600	3,000	3.2
	10/6	R4	9,720	3,600	2.7
Catchable subtotal			67,979	19,970	3.4
Fingerling subtotal			30,000	297	101.0
Manns Lake	3/5	SSRB	8,900[b]	2,967	3.0
	3/5	SSRB	100[a]	33	3.0
	4/30	SSRB	40,000[b]	379	106.0
	5/26	R4	5,125	2,050	2.5
	6/15	R4	5,003	2,175	2.3
Catchable subtotal			19,128	7,225	2.6
Fingerling subtotal			40,000	379	106.0
Soldiers Meadow Reservoir	4/22	R4	100[a]	37	2.7
	4/23	R4	10,370	3,050	3.4
	6/26	R4	4,970	1,400	3.5
	9/25	K1	9,900[c]	3,000	3.3
Catchable subtotal			25,340	7,487	3.4

Table 2. Continued.

Body of water	Date stocked	Species stocked	Number stocked	Pounds stocked	Fish/ pound
Dworshak Reservoir	6/9	R1	80,400	1,340	60.0
	7/21	K2	55,373[c]	2,250	24.6
	7/23	K2	38,483[c]	1,505	25.6
Fingerling subtotal			174,256	5,095	34.2
Waha Lake	4/2	Ri	9,000	3,000	3.0
	5/26	R4	3,125	1,250	2.5
	10/5	K1	12,672[c]	980	12.8
	10/8	R4	7,200	3,000	2.4
Catchable subtotal			19,325	7,250	2.7
Fingerling subtotal			12,672	980	12.8
Moose Creek Reservoir	4/7	R4	5,070	1,950	2.6
	5/28	R4	3,300	1,100	3.0
	10/5	K1	11,520[c]	900	12.8
	10/6	R4	7,290	2,700	2.7
Catchable subtotal			15,660	5,750	2.7
Fingerling subtotal			11,520	900	12.8
Elk Creek Reservoir	4/6	R4	6,000	2,400	2.5
	5/28	R4	2,100	700	3.0
	7/23	K2	10,035[c]	390	25.7
Catchable subtotal			8,100	3,100	2.6
Fingerling subtotal			10,035	390	25.7
Blue Lake	4/23	R4	2,000	741	2.7
Campbells Pond	4/22	R4	2,500	926	2.7
	10/16	R4	2,000	1,000	2.0
Catchable subtotal			4,500	1,926	
Robinsons Pond	4/22	R4	1,000	370	2.7

Table 2. Continued.

Body of water	Date stocked	Species stocked	Number stocked	Pounds stocked	Fish/ pound
Lewiston Levee Ponds	9/30	CC	500[c]	167	3.0
	10/16	R4	2,000	1,000	2.0
Camp Grizzly Pond	6/12	R4	500	143	3.5
RAINBOW CATCHABLE GRAND TOTAL			203,977	67,599	3.0
RAINBOW FINGERLING GRAND TOTAL			308,483	8,338	37.0
CHANNEL CATFISH GRAND TOTAL			500	167	3.0

[a]Tagged with $5.00 reward jaw tag.
[b]Spokane strain rainbow trout from Lyons Ferry Hatchery in Washington.
[c]Marked with an adipose fin clip.

Table 3. Estimated shore angler effort and fish harvested at Winchester Lake, April 25-October 31, 1987.

Interval date	Number	Estimated hours fished	Species caught HRB[a]	BB[b]	Total
4/25-5/8	1	8,268	8,599	554	9,153
5/9-5/22	2	6,262	5,072	1,252	6,324
5/23-6/5	3	3,984	1,514	1,155	2,669
6/6-6/19	4	3,378	1,655	2,162	3,817
6/20-7/3	5	2,984	895	7,012	7,907
7/4-7/17	6	2,044	1,778	286	2,064
7/18-7/31	7	2,813	1,463	591	2,054
8/1-8/14	8	1,878	1,108	732	1,840
8/15-8/28	9	2,412	1,471	1,351	2,822
8/29-9/11	10	1,999	1,120	1,339	2,459
9/12-9/25	11	1,872	1,330	318	1,648
9/26-10/9	12	778	646	58	704
10/10-10/31	13	1,760	2,376	0	2,376
TOTAL		40,432	29,027	16,810	45,837

[a]Hatchery rainbow trout.
[b]Brown bullheads.

Table 4. Estimated boat angler effort and hatchery rainbow trout (HRB) harvested at Winchester Lake, April 25-October 31, 1987.

Interval date	Number	Estimated hours fished	Estimated HRB harvested
4/25-5/8	1	1,095	1,621
5/9-5/22	2	896	1,183
5/23-6/5	3	512	194
6/6-6/19	4	180	88
6/20-7/3	5	368	110
7/4-7/17	6	64	56
7/18-7/31	7	403	210
8/1-8/14	8	402	237
8/15-8/25	9	132	80
8/29-9/11	10	19	11
9/12-9/25	11	0	0
9/26-10/9	12	84	70
10/10-10/31	13	0	0
TOTAL		4,155	3,860

The average weekend count at Winchester was 36.5 anglers, while the average weekday count was 14.5. For all days combined, the overall average angler count was 26.1. On weekends, 9.9% of the anglers counted were fishing from boats, while 90.1% fished from shore. Weekday percentages were very similar at 9.6 and 90.4, respectively.

Estimated angler use during the general season at Winchester Lake during 1987 was 525 hours per acre. This effort level places Winchester second only to Spring Valley Reservoir among Region 2 lowland lakes for which effort estimates were obtained (Table 5).

No expanded estimate of effort was made during the ice fishing season from January 1 through February 15. However, during that time a total of 42 anglers were interviewed. They had fished 128 hours to catch 70 hatchery rainbow trout for an overall catch rate of 0.55 trout per hour.

By the end of the season, 55 of the 100 reward tags placed on rainbow trout stocked on April 22 were returned. Of the 55 tag returns, 50.9% were caught during May (Figure 1).

Limnological data collected at Winchester Lake on July 29, 1987 showed a surface temperature of 22°C, dropping to 19°C at 3 m and 11.5°C at 6 m. Dissolved oxygen declined from 7.4 ppm on the surface to 2.3 ppm at 4 m. The Secchi disk reading on July 29, 1987 was 1.1 m.

Two floating horizontal gill nets set at Winchester Lake at 2 p.m. on October 5 and pulled at 9 a.m. on October 6 caught 140 rainbow trout, 19 brown bullhead and 3 largemouth bass. The rainbow trout consisted of 101 adipose-clipped Kamloops, 20 Spokane-strain rainbow and 19 R1 rainbow. The Spokane-strain fish which were released into Winchester at 101 per pound (4.5 g per fish) on April 29, 1987 averaged 225 mm (8.9 in) and 122.5 g by early October. The bullhead averaged 243 mm (9.6 in) and 253 g. The three largemouth bass ranged from 205-340 mm (8.1-13.4 in).

Spring Valley Reservoir

Anglers expended an estimated 39,835 hours to harvest 45,597 hatchery rainbow trout and 1,667 largemouth bass for an overall catch rate of 1.19 fish per hour. Shore anglers fished 34,981 hours to harvest 40,786 trout and 1,503 bass (1.21 fish/hour) (Table 6). Boat anglers fished 4,835 hours to catch 4,811 trout and 164 bass (Table 7).

The average weekend count at Spring Valley was 48.4 anglers, while the average weekday count was 14.4. The average angler count for all days combined was 30.7. On weekends, 13.8% of the anglers counted were fishing from boats, while 86.2% were fished from shore. Weekday participation by boaters was somewhat less at 7.8%.

Spring Valley supported the highest density of angler use of any Region 2 lowland lake during 1987 at an estimated 752 hours per acre (Table 5).

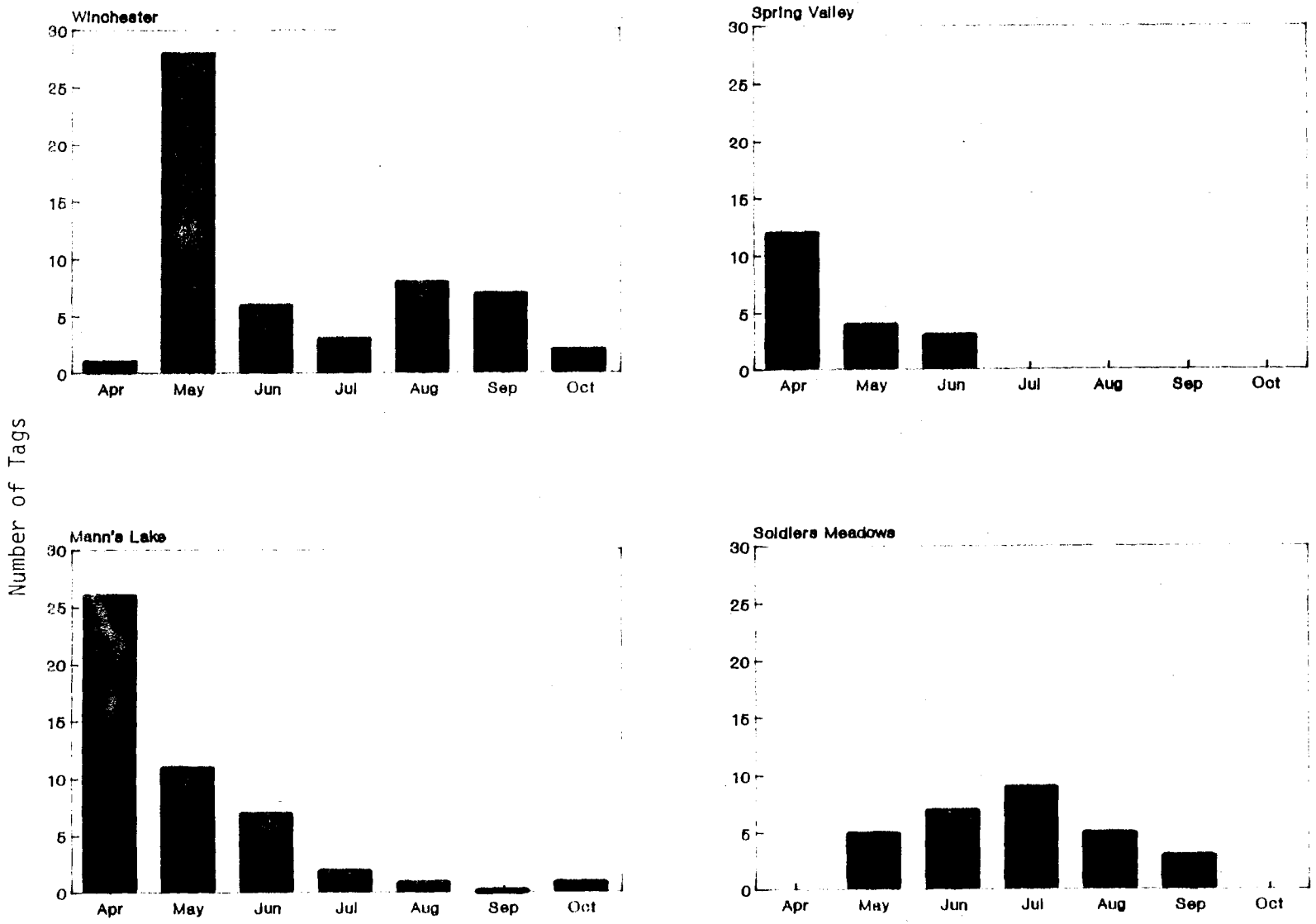

Figure 1. Return distribution of $5.00 reward tags from four lowland lakes in region 2 during 1987.

Table 5. Comparison of estimated angler effort and harvest of hatchery rainbow trout (HRB) at selected Region 2 lowland lakes, 1987.

Lake	Area acres (ha)	1987 HRB stocked catchable (fingerling)	Catchable stocking rate number/acre (number/ha)	Estimated angler hours	Hours/acre (hours/ha)	Estimated HRB harvested	Pounds of trout per acre	Catch rate trout/hour	Estimated % HRB return Tags	Harvest est.
Winchester	85 (34)	38,445 (30,000)	452 (1,131)	44,587	525 (1,311)	32,887	129	0.74	55	48
Spring Valley	53 (21)	67,919 (30,000)	1,283 (3,237)	39,835	752 (1,897)	45,597	297	1.14	38	46
Manns Lake	145 (58)	19,128 (40,000)	132 (330)	20,313	140 (350)	21,390	57	1.05	52	55
Soldiers Meadow	101 (40)	25,340 (0)	251 (634)	12,514	124 (313)	11,881	35	0.95	29	47

Table 6. Estimated shore angler effort and fish harvested at Spring Valley Reservoir, April 25-October 31, 1987.

Interval date	Number	Estimated hours fished	Species caught		
			HRB[a]	LMB[b]	Total
4/25-5/8	1	6,516	8,275	26	8,301
5/9-5/22	2	4,646	5,808	42	5,850
5/23-6/5	3	3,156	1,515	230	1,745
6/6-6/19	4	4,008	4,729	0	4,729
6/20-7/3	5	3,192	1,787	202	1,989
7/4-7/31	6	3,480	3,340	0	3,340
8/1-8/28	7	3,984	2,231	522	2,753
8/29-9/25	8	1,915	1,666	73	1,739
9/26-10/31	9	4,084	11,435	408	11,843
TOTAL		34,981	40,786	1,503	42,289

[a]Hatchery rainbow.
[b]Largemouth bass.

Table 7. Estimated boat angler effort and fish harvested at Spring Valley Reservoir, April 25-October 31, 1987.

Interval date	Number	Estimated hours fished	Species caught HRB[a]	LMB[b]	Total
4/25-5/8	1	1,080	993	4	997
5/9-5/22	2	336	420	3	423
5/23-6/5	3	588	282	43	325
6/6-6/19	4	864	1,019	0	1,019
6/20-7/3	5	240	135	15	150
7/4-7/31	6	768	737	0	737
8/1-8/28	7	480	268	63	331
8/29-9/25	8	225	196	9	205
9/26-10/31	9	272	761	27	788
TOTAL		4,853	4,811	164	4,975

[a]Hatchery rainbow trout.
[b]Largemouth bass.

The return to the creel of hatchery rainbow at Spring Valley, based on reward tag returns, was 38% during 1987. Of the 19 tag returns from Spring Valley, 63.2% were caught during May.

Limnological data collected at Spring Valley Reservoir on August 4, 1987 indicated a surface temperature of 21.5°C, dropping to 14.5°C at 5 m and 8°C at 8 m. Dissolved oxygen declined from 6.1 ppm on the surface to 0.7 ppm at 6 m. Secchi disc reading on August 4 was 4.8 m.

Manns Lake

Anglers expended an estimated 20,313 hours of effort at Manns Lake during 1987 to harvest 21,390 rainbow trout and 1,159 black crappie for an overall catch rate of 1.11 fish/hour. Shore anglers fished 18,222 hours to harvest 19,012 trout and 1,132 crappie (1.10 fish/hour) (Table 8). Boat anglers fished 2,091 hours to catch 2,408 trout and 27 crappie (1.17 fish/hour) (Table 9).

The average weekend count at Manns Lake was 14.7 anglers, while the average weekday count was 6.2. The average angler count for all days combined was 10.0. Boat anglers comprised 14.6% of the weekend counts and 8.3 % of those counted on weekdays.

Manns Lake ranked third in angler density among the four lakes studied. An estimated 140 angler hours per acre were expended during 1987.

Based on returns of reward tags, Manns Lake yielded a return to the creel of 52% of the hatchery rainbow planted prior to the April 25 opener. Of the 52 reward tags returned, 26 (54Z) were from fish caught during the first six days of the season (April 25-30) (Table 5).

Two floating horizontal gill nets set in Manns Lake at 3 p.m. on October 1 and pulled at 9 a.m. on October 2 caught 28 rainbow trout, 38 black crappie, 11 largemouth bass and 2 suckers. None of the rainbow trout could be positively identified as Spokane-strain fish, even though 30,000 fingerlings of this strain had been released into the lake on April 30, 1987. The crappie averaged 174 mm (6.9 in.); the largemouth averaged 160 mm (6.3 in.). Larger bass are not readily caught in gill nets.

Soldiers Meadow Reservoir

Anglers fishing at Soldiers Meadow Reservoir during 1987 expended an estimated 12,514 hours of effort to harvest 11,881 rainbow trout (0.95 trout per hour). Shore anglers fished 10,943 hours to harvest 10,477 trout (0.96 per hour) (Table 10). Boat anglers fished 1,571 hours to catch 1,404 rainbow trout (0.89 trout per hour) (Table 11).

Table 8. Estimated shore angler effort and fish harvested at Manns Lake, April 25-November 30, 1987.

Interval date	Number	Estimated hours fished	Species caught HRB[a]	BC[b]	Total
4/25-5/8	1	4,294	5,496	76	5,572
5/9-5/22	2	1,993	1,276	0	1,276
5/23-6/5	3	2,076	1,702	0	1,702
6/6-6/19	4	972	91.4	0	914
6/20-7/3	5	1,544	1,234	0	1,235
7/4-7/31	6	3,420	4,548	349	4,897
8/1-8/14	7	546	257	218	475
8/15-8/28	8	660	489	0	489
8/29-9/11	9	384	469	0	469
9/12-9/25	10	732	615	0	615
9/26-10/9	11	430	417	132	549
10/10-10/23	12	708	1,027	71	1,098
10/24-11/6	13	370	499	286	785
11/7-11/30	14	93	68	0	68
TOTAL		18,222	19,012	1,132	20,144

[a]Hatchery rainbow trout.
[b]Black crappie.

Table 9. Estimated boat angler effort and fish harvested at Manns Lake, April 25-November 30, 1987.

		Estimated	Species caught		
Interval date	Number	hours fished	HRB[a]	BC[b]	Total
4/25-5/8	1	1,175	1,692	21	1,713
5/9-5/22	2	430	330	0	330
5/23-6/5	3	240	197	0	197
6/6-6/19	4	16	15	0	15
6/20-7/3	5	200	160	0	160
7/4-7/31	6	0	0	0	0
8/1-8/14	7	30	14	6	20
8/15-8/28	8	0	0	0	0
8/29-9/11	9	0	0	0	0
9/12-9/25	10	0	0	0	0
9/26-10/9	11	0	0	0	0
10/10-10/23	12	0	0	0	0
10/24-11/6	13	0	0	0	0
11/7-11/30	14	0	0	0	0
TOTAL		2,091	2,408	27	2,435

Table 10. Estimated shore angler effort and hatchery rainbow trout (HRB) harvest at Soldiers Meadow Reservoir, April 25-October 31, 1987.

Interval date	Number	Estimated hours fished	Estimated HRB harvested
4/25-5/8	1	2,064	2,146
5/9-5/22	2	744	863
5/23-6/5	3	1,212	1,151
6/6-6/19	4	1,748	1,416
6/20-7/17	5	2,191	1,972
7/18-7/31	6	920	883
8/1-8/14	7	468	482
8/15-8/28	8	528	559
8/29-9/11	9	544	326
9/12-9/25	'10	300	423
9/26-10/9	11	48	80
10/10-10/31	12	176	176
TOTAL		10,943	10,477

Table 11. Estimated boat angler effort and hatchery rainbow trout (HRB) harvest at Soldiers Meadow Reservoir, April 25-October 31, 1987.

Interval date	Number	Estimated hours fished	Estimated HRB harvested
4/25-5/8	1	288.	204
5/9-5/22	2	0	0
5/23-6/5	3	0	0
6/6/-6/19	4	244	198
.6/20-7/17	5	415	373
7/18-7/31	6	456	437
8/1-8/14	7	120	124
8/15-8/28	8	0	0
8/29-9/11	9	0	0
9/12-9/25	10	48.	68
9/26-10/9	11	0	0
10/10-10/31	12	0	
TOTAL		1,571	1,404

The average weekend count at Soldiers Meadow was 11.2 anglers, while the average weekday count was 4.0. The average angler count for all days combined was 6.9. Boat anglers comprised 14.22 of the weekend counts and 13.62 of the weekday counts.

Soldiers Meadow ranked last in angler density among the four lakes studied. An estimated 124 angler hours per acre were expended during 1987. The fact that the reservoir never filled completely in 1987 may have depressed angler effort somewhat.

Based on returns of reward tags, Soldiers Meadow yielded a return to the creel of 292 of the hatchery rainbow stocked (Table 5).

Waha Lake

Although no formalized catch-effort estimates were made on Waha Lake, a total of 31 angler counts were made between April 25 and November 19, 1987. The average weekend count was 6.25 anglers, while the average weekday count was 2.0 anglers. Boat anglers comprised 252 of the total anglers counted.

Department personnel interviewed a total of 45 anglers at Waha during 1987. They had fished 80 hours to catch 68 hatchery rainbow trout and 5 smallmouth bass. The overall catch rate was 0.91 fish per hour (Table 12).

Moose Creek Reservoir

A total of 18 angler counts were made at Moose Creek Reservoir between April 25 and October 10, 1987. The average weekend count was 16.6 anglers, while the average weekday count was 3.7 anglers. Boat anglers comprised 162 of the total anglers counted.

Department personnel interviewed a total of 143 anglers at Moose Creek Reservoir during 1987. They had fished 322 hours to harvest 274 hatchery rainbow trout, 4 largemouth bass and 4 bullhead. The overall catch rate was 0.88 fish per hour (Table 12).

Elk Creek Reservoir

Department personnel interviewed a total of 46 anglers at Elk Creek Reservoir during 1987. They had fished 162 hours to harvest 65 hatchery rainbow trout and 13 brook trout. The overall catch rate was 0.48 fish per hour (Table 12).

Blue Lake

A total of 13 angler counts were made at Blue Lake between April 25 and July 11, 1987. The average weekend count was 5.2 anglers, while the average weekday count was 1.5 anglers.

Table 12. Catch statistics from angler creel checks made on Region 2 lowland lakes and reservoirs, 1987.

Body of water	Anglers	Hours fished	Total fish caught	Fish/hour
Dworshak Reservoir	195	534	219	0.41
Winchester Lake	1,024	1,853	1,841	0.99
Spring Valley Reservoir	607	1,135	1,225	1.08
Soldiers Meadow Reservoir	271	555	532	0.96
Manns Lake	423	744	790	1.06
Moose Creek Reservoir	143	32	282	0.88
Elk Creek Reservoir	46	162	78	0.48
Campbells Pond	44	87	48	0.55
Waha Lake	45	80	68	0.85
Blue Lake	21	31	38	1.23
TOTAL	2,819	5,503	5,121	0.93

Department personnel interviewed a total of 21 anglers at Blue Lake during 1987. They had fished 31 hours to harvest 38 hatchery rainbow trout for an overall catch rate of 1.23 fish per hour (Table 12).

DISCUSSION

The creel census completed on Winchester, Soldiers Meadow, Spring Valley and Manns Lake during the 1987 fishing season was very revealing as to the amount of fishing effort the lowland lakes receive within the Region. Winchester supported the most effort with 45,000 hours, followed by Spring Valley with 40,000 hours, Manns Lake with 20,000 hours and Soldiers Meadow Reservoir with 13,000 hours (Table 5). The effort information suggests that total fishing pressure for the 8 lowland lakes in the Region could exceed 150,000 hours annually. Those lakes have a surface area of 240 ha (600 acres), which translates to 625 hours/ha (250 hours/acre). Catch rates for the entire season from the 4 lakes censused averaged 1.0 fish/hour (Table 5).

The fisheries in Region 2 lowland lakes is supported primarily by hatchery rainbows. Warmwater species make a significant contribution to the fisheries in two reservoirs (Table 13).

Return to the creel estimates based on estimated catch versus fish stocked (both fingerlings and catchables) averaged 50Z for the 4 lakes. Reward tag returns averaged 44Z and ranged from 29 to 55% (Table 5). The distribution of reward tag returns is described in Figure 1. At Manns Lake, 50% of the tags were returned by the end of the first week of the season. By the end of the first month (May) of the season, 77Z, 63%, 53% and 17% of the tags were returned from Manns Lake, Spring Valley, Winchester and Soldiers Meadow, respectively. Tag returns peaked in July at Soldiers Meadow and by the month's end, 72% of the tags were returned (Figure 1).

Making estimates of exploitation from harvest estimates and known stocking rates is difficult at best because of the unknown variable of carryover of fish from the previous season. Also, it is difficult to assess when fingerling releases are fully recruited to the angling year. Some anglers grade their catch (i.e., they release the smaller fish in hope of catching larger ones).

Estimating exploitation based on return of tags assumes a minimum harvest. Even though there was a $5.00 reward for the tags, some were not returned. That was evidenced by some anglers telling the creel clerks they had tags in their possession but had not returned them.

Because of the variability in attempting to make the two estimates of exploitation, those harvest returns described in Table 5 are likely minimum estimates. Balancing the fingerling releases and the timing of their recruitment to the angling year with the previous year's carryover would increase the exploitation rate closer to 60-75%. Also, assuming a 10 to 20% nonreturn of reward tags would increase the exploitation.

Table 13. Species composition of fish checked in anglers' creels on Region 2 lowland lakes and reservoirs, 1987.

Body of water	Percent of catch by species							
	HRB[a]	KOK[b]	CT[c]	BK[d]	BC[e]	BCR[f]	SB[g]	LB[h]
Dworshak Reservoir	27.4	72.6						
Winchester Lake	69.0				30.9			0.1
Spring Valley Reservoir	96.9							
Manns Lake	93.5					6.5		
Soldiers Meadow	100.0							
Waha Lake	93.1						6.9	
Moose Creek Reservoir	97.2				1.4			1.4
Elk Creek Reservoir	83.3			16.7				
Blue Lake	100.0							
Campbells Pond	100.0							

[a]HRB = hatchery rainbow trout
[b]KOK = kokanee
[c]CT = cutthroat
[d]BK = brook trout
[e]BC = bullhead catfish
[f]BCR = black crappie
[g]SB = smallmouth bass
[h]LB = largemouth bass

Overall, the exploitation data indicates that return to the creel in the lowland lakes is very good. Also, angler satisfaction appears adequate, with catch rates averaging 1.0 fish/hour. Some anglers complain that fishing is too good when they limit out in several hours and have to stop.

Effort throughout the season is described in Figure 2. Fishing activity peaked early in the season and then slowed as surface waters warmed in early to midsummer. As a strong thermocline forms in midsummer, bank fishing becomes less successful, hence a significant reduction in effort. Much of the decline in fishing pressure in Soldiers Meadow and Manns Lake was the result of extreme drawdown necessitated by irrigation demand (Figure 2). Spring Valley and Winchester are not subjected to irrigation demand, which results in relatively constant lake level throughout the season.

We correlated catch rate data versus annual stocking rates in Manns Lake, Spring Valley, Winchester and Soldiers Meadow reservoirs from 1980 to 1987 (Figure 3). Catch rate information used from the early 1980s was somewhat limited in sample size and time of collection, but the correlation coefficient ($r=0.53$) was significant ($P<0.01$). The data suggests that as stocking rates increase, so do catch rates up to an upper limit. Stocking rates above 2,000/ha (800/acre) produced little increase in catch rate (Figure 3). Using the regression generated in Figure 3, stocking rates were established for each of the lowland lakes (Table 1).

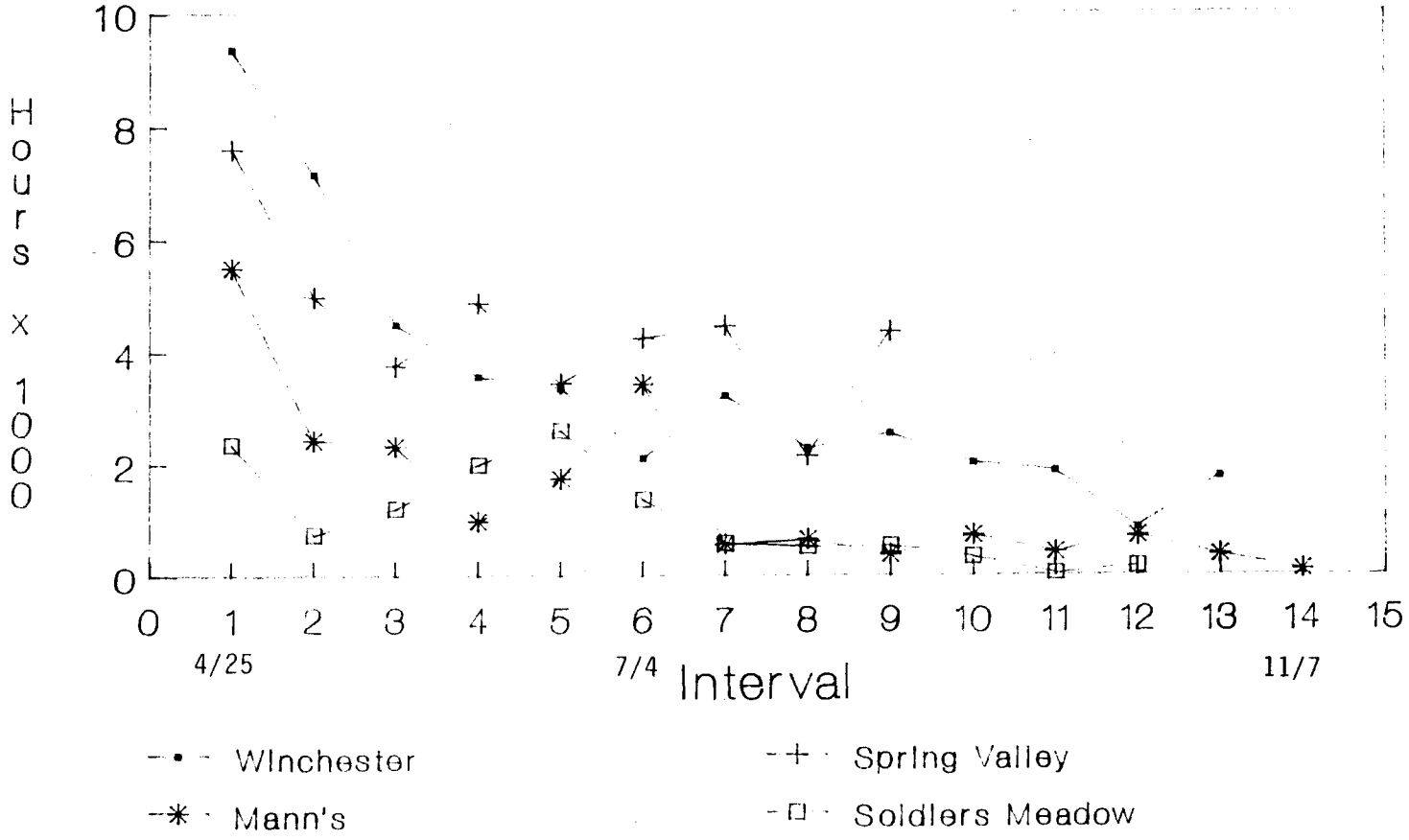

Figure 2. Effort estimates by interval from four lowland lakes within region 2 during 1987.

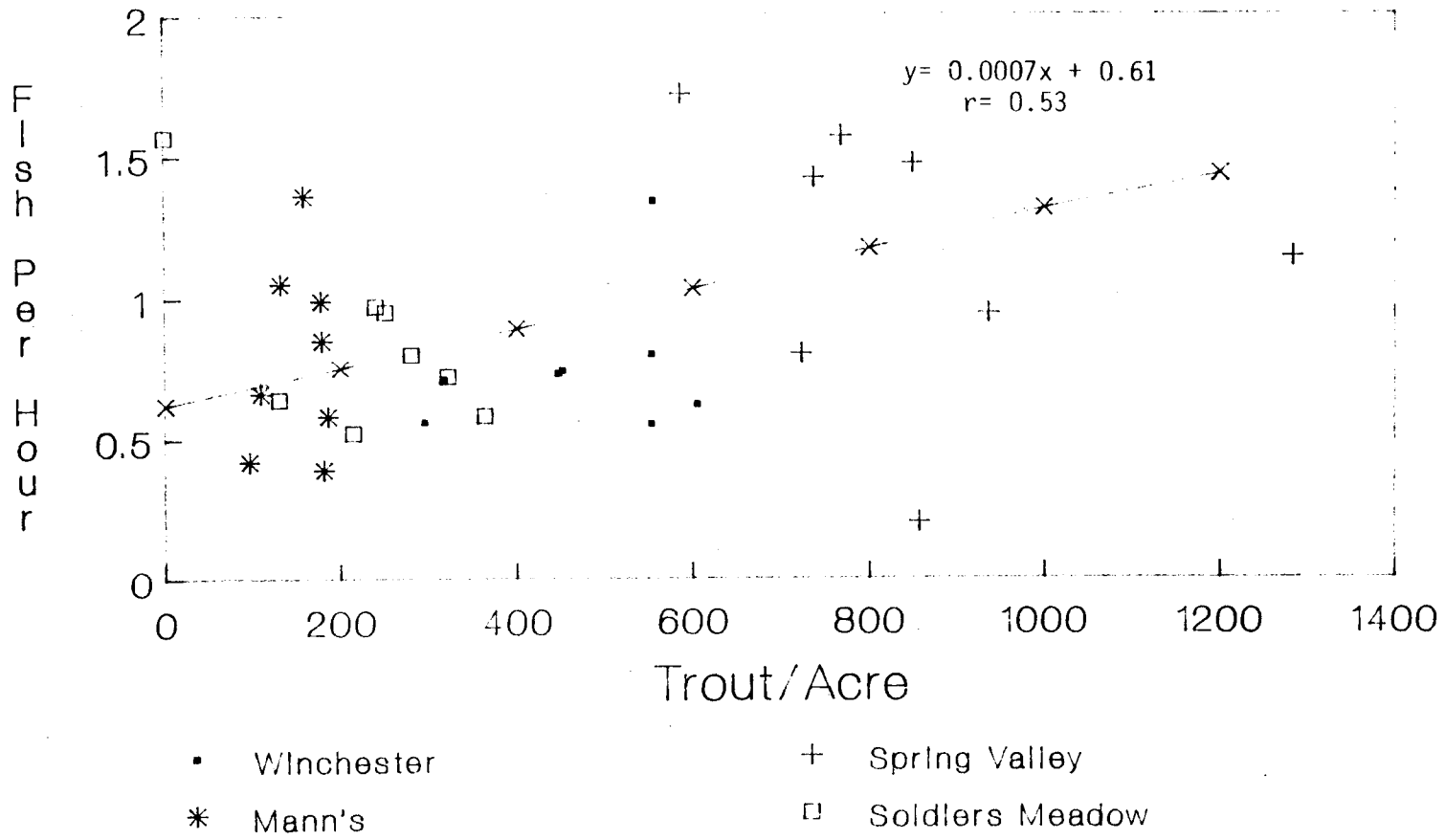

Figure 3. Regression analysis of stocking rates (trout/acre) vs catch rates (fish/hour) from four lowland lakes within region 2 from 1980-87.

JOB PERFORMANCE REPORT

State of: Idaho **Project** **Name:** REGIONAL FISHERY MANAGEMENT INVESTIGATIONS

No.: F-71-R-12

Subproject No.: 2-c **Title:** Region 2 Rivers and Streams Investigations

Period Covered: July 1, 1987 to June 30, 1988

ABSTRACT

Department personnel interviewed a total of 837 anglers on 21 different streams in Region 2 during 1987. The average catch rate was 0.66 fish per hour. Seventy-nine percent of the anglers interviewed were Idaho residents.

Regional fisheries personnel continued monitoring juvenile salmon and steelhead densities by snorkeling transects in selected Region 2 streams during 1987.

Reward tags were placed on hatchery rainbow trout which were released into the lower Lochsa and Lower Selway rivers to obtain an estimate of percent return to the creel of hatchery trout in these streams. Returns were less than 4X from the Selway and less than 3% from the Lochsa.

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OBJECTIVES

1. To evaluate the contribution of wild fish populations to the fishery management program within the rivers and streams in Region 2.

2. To evaluate the contribution of hatchery catchables to the fishery program within the rivers and streams in the Region.

3. To develop recommendations to improve the efficiency of stocking hatchery catchables in the rivers and streams in the Region.

4. To monitor parr densities of salmon and steelhead in selected Region 2 streams and rivers by snorkeling established transects.

RECOMMENDATIONS

1. Reduce by 30 to 50% the number of catchables stocked into the rivers and streams in the Region. Stock stream reaches that are established fishing sites with fewer fish but more frequently. Emphasize to the conservation officers the need for additional stocking sites that will yield a good return to the creel.

2. Discontinue stocking catchables into streams that receive steelhead smolts. Residualized smolts provide good to excellent fishing through most of the summer.

3. Establish snorkeling transects in the Little North of the Clearwater to assess the status of the cutthroat, rainbow and bull trout populations.

4. Continue to snorkel established transects to monitor densities of salmon and steelhead as part of the statewide effort to index wild and natural production.

TECHNIQUES USED

Hatchery rainbow trout were stocked periodically from April through June in fifteen Region 2 streams during 1987 (Table 1). On September 30, we released 9,130 adipose-clipped channel catfish into the Snake River near Pittsburgh Landing. These catfish were distributed both upstream and downstream from Pittsburgh Landing using a jet boat equipped with a live well.

Reward jaw tags ($5.00 each) were placed on 160 hatchery rainbow trout which were distributed equally into the lower Lochsa (from Boulder Creek downstream) and lower Selway (from Selway Falls downstream) on May 21, 1987. These fish averaged 2.5 per pound. Water temperatures at the time of stocking were 9 and 10^{0}C in the Lochsa and Selway, respectively.

Table 1. Summary of fish releases into Region 2 streams, 1987.

Body of water	Date stocked	Species stocked	Number stocked	Pounds stocked	Fish/ pound
Lochsa River	5/21	R4	2,500	1,000	2.5
	5/21	R4	80[a]	32	2.5
	6/11	R4	2,500	714	3.5
Subtotal			5,080	1,746	2.9
Selway River	5/21	R4	2,500	1,000	2.5
	5/21	R4	80[a]	32	2.5
	6/11	R4	2,500	714	3.5
Subtotal			5,080	1,746	2.9
Red River	5/23	R4	2,000	800	2.5
	6/10	R4	3,000	857	3.5
Subtotal			5,000	1,657	3.0
Palouse River	4/24	R4	1,892	701	2.7
	6/12	R4	2,000	571	3.5
Subtotal			3,892	1,272	3.1
Little Sand Creek	4/24	R4	108	40	2.7
Potlatch Creek	4/24	R4	1,000	370	2.7
East Fork Potlatch	4/24	R4	2,000	741	2.7
Orofino Creek	5/22	R4	500	200	2.5
Rhodes Creek	5/22	R4	875	350	2.5
Quartz Creek	5/22	R4	500	200	2.5
Lolo Creek	5/22	R4	625	250	2.5
Lawyers Creek	4/23	R4	2,000	741	2.7
Slate Creek	6/11	R1	500	157	3.2
Skookumchuck Creek	6/11	R1	500	156	3.2
Crooked Creek	5/23	R4	500	200	2.5
Snake River	9/30	CC	9,130	3,043	3.0
CATCHABLE TROUT GRAND TOTAL			28,160	9,826	2.9
CHANNEL CATFISH GRAND TOTAL			9,130	3,043	3.0

[a]Marked with $5.00 reward jaw tags.

Department personnel conducted random creel checks on Region 2 streams during 1987 to obtain catch rates and species composition data.

FINDINGS

Regional River and Stream Creel Census

Department personnel interviewed a total of 837 anglers on 21 different streams in Region 2 during 1987. They had fished 1,564 hours to catch 1,037 fish for an overall catch rate of 0.66 fish per hour. Seventy-nine percent of the anglers interviewed on Region 2 streams during 1987 were Idaho residents (Table 2).

Table 3 and Appendix B provide a summary of species composition of fish checked from the streams of Region 2 during 1987. Hatchery rainbow trout comprised a majority of the catch in 7 of the 21 streams where fish were checked. Adipose-clipped steelhead smolts were most important in five streams, cutthroat and wild rainbow in three each and adult steelhead, smallmouth bass and whitefish in one each.

Lochsa and Selway Reward Tag Returns

Returns from the 80 reward tags released in both the Lochsa and Selway were very low. Three tags were received from the Selway and 2 from the Lochsa.

Two of the Selway tagged fish were caught on May 23 and the other on June 11. The Lochsa tagged fish were caught on June 3 and July 4. Several factors may have influenced these low returns. No formal creel census was conducted on either stream, so few anglers were contacted by Department personnel. Both streams are approximately 100 miles from the Regional office. Though stream flows were low because of the drought, water temperatures were still relatively cold during the May 21 release.

A previous study conducted on the Lochsa River from 1976 through 1980 indicated considerably higher returns of hatchery catchable rainbow (Lindland and Pettit 1981). During those years, an intensive angler count-interview type creel census was used to estimate total angler effort and catch for all species of fish on the Lochsa River. Hatchery rainbow trout were easily separated from wild rainbow because of the fin erosion present on hatchery fish. Estimated percent return of hatchery rainbow ranged from a low of 20.2 to a high of 34.1, with an average return over the five-year interval of 27.92.

Table 2. Catch statistics for resident fish species checked from angler creels on Region 2 streams, 1987.

Body of water	Anglers Res.	Anglers NR	Hours fished	Total fish caught	Fish/hour
South Fork Clearwater	77	20	181	160	0.88
Red River	26	2	32	16	0.50
Crooked River	2	0	2	6	3.00
Newsome Creek	21	0	54	53	0.98
Subtotal	126	22	269	235	0.87
Selway River					
Mouth to falls (Catch-and-keep)	26	8	48	22	0.46
Gedney Creek	3	0	5	13	2.60
Subtotal	29	8	53	35	0.66
Lochsa River					
Mouth to Wilderness Gateway Bridge (Catch-and-keep)	33	4	50	42	0.84
Middle Fork Clearwater	2	0		1	
North Fork Clearwater					
Above Dworshak Reservoir	61	6	110	88	0.80
Orogrande Creek	18	3	16	20	1.25
Skull Creek	4	0	4	3	0.75
Lake Creek	1	0	1	0	0.00
Subtotal	84	9	131	111	0.85
Clearwater River	135	25	245	143	0.58
Quartz Creek	2	0	6	6	1.00
Lawyers Creek	17	0	6	10	1.67
Subtotal	154	25	257	159	0.62
Salmon River	13	1	57	4	0.07
Little Salmon	21	0	29	39	1.34
Slate Creek	1	2	5	4	0.80
Crooked Creek	6	0	13	9	0.69
Big Creek	7	1	16	8	0.50
Subtotal	48	4	120	64	0.53
Snake River	184	105	682	390	0.57
TOTAL	660	177	1,564	1,037	0.66

Table 3. Species composition of fish checked in anglers' creels on Region 2 streams, 1987.

Body of water	Percent of catch by species[a]									
	WRB	HRB	SH	CT	BK	DV	WF	BA	CC	STG
South Fork Clearwater River	18.7	3.8	65.0[S]	5.6	2.5	3.8	0.6			
Red River		43.7	25.0[S]	18.7		12.6				
Crooked River			100.0[S]							
Newsome Creek	20.7	15.1	52.8[S]	7.5			3.9			
Selway River										
Mouth to falls (C-K)		68.2		22.7		4.5	4.6			
Gedney Creek		100.0								
Lochsa River [Mouth to Wilderness Gateway (C-K)]	33.3	52.4		11.9		2.4				
Middle Fork Clearwater R.							100.0			
North Fork Clearwater										
Above Dworshak Reservoir	23.9			46.6		13.6	15.9			
Orogrande Creek	75.0				20.0	5.0				
Skull'Creek	33.3			66.7						
Clearwater River			91.0[S]					0.7		
Quartz Creek		50.0			50.0					
Lawyers Creek		100.0								
Salmon River			100.0[A]							
Little Salmon River			100.0[S]							
Slate Creek	75.0					25.0				
Crooked Creek		88.9		11.1						
Big Creek	100.0									
Snake River		31.6	14.1[S]					44.4	1.3	6.0[R]
			2.6[A]							

[a]WRB=wild rainbow trout, HRB=hatchery rainbow trout, SH=steelhead, CT=cutthroat trout, BK=brook trout, DV=Dolly Varden, WF=whitefish, BA=bass, CC=channel catfish, and STG = sturgeon.

[S] smolt.

[A] adult.

[R] released.

Juvenile Salmon and Steelhead Density Monitoring

We continued the monitoring of juvenile salmon and steelhead densities by snorkeling transects in selected Region 2 streams during 1987. Table 4 summarizes our 1987 findings. Appendix C compares 1987 findings with those of 1985 and 1986.

Snake River tributaries snorkeled each year have been Captain John Creek, Wolf Creek, Sheep Creek, and Granite Creek. For the third year in a row, Wolf Creek showed the highest density of steelhead fry. Sheep Creek had the highest densities of both age I and age II steelhead. Again, no juvenile chinook were seen in any of the Snake River tributaries which were snorkeled.

Selway River tributaries snorkeled a're White Cap Creek, Running Creek, Bear Creek, and Moose Creek. Numbers of all age classes of juvenile steelhead have averaged less than 3 fish/100 m^2 in each Selway tributary since monitoring began in 1985. Juvenile chinook numbers are also very low, with a high at 3.3/100 m^2 in Bear Creek in 1986.

Table 4. Densities of juvenile salmon and steelhead (fish/100 m²) in selected Region 2 streams, 1987.

Stream	Transect	Area (m²)	RB-SH[a] <3	RB-SH[a] 3-6	RB-SH[a] 6-9	RB-SH[a] 9-12	RB-SH[a] 12-15	[b] CK	[c] DV	[d] BK	[e] CT	[f] WF
Capt. John Cr.	1	320	57 (17.80)	33 (10.30)	3 (0.94)	0	0	0	0	0	0	0
	2	180	27 (15.00)	18 (10.00)	3 (10.00)	3 (1.67)	0	0	0	0	0	0
	Combined	500	84 (16.80)	51 (10.20)	6 (1.20)	3 (0.60)						
Wolf Cr.	1	141	78 (55.30)	14 (9.90)	8 (5.67)	0	0	0	0	0	0	0
Sheep Cr.	1	133	35 (26.30)	16 (12.00)	21 (15.80)	9 (6.80)	6 (4.50)	0	1 (0.75)	0	0	0
	2	512	7 (1.37)	20 (3.90)	5 (0.98)	0	1 (0.19)	0	2 (0.39)	0	0	0
	Combined	645	42 (6.50)	36 (5.60)	26 (4.00)	9 (1.40)	7 (1.10)	0	3 (0.46)	0	0	0
Granite Cr.	1	210	32 (15.20)	13 (6.20)	13 (6.20)	3 (1.40)	0	0	0	0	0	
	2	156	25 (16.00)	9 (5.80)	6 (3.80)	1 (0.64)	1 (0.64)	0	0	0	0	0
	3	200	0	9 (4.50)	7 (3.50)	5 (2.50)	5 (2.50)	0	2 (1.00)	0	0	0
	Combined	566	57 (10.10)	31 (5.50)	26 (4.60)	9 (1.60)	6 (1.10)	0	2 (0.35)	0	0	0
Running Cr.	1	1.045	19 (1.82)	16 (1.53)	0	0	0	5 (0.48)	0	0	10 (0.96)	0
	2	960	13 (1.35)	12 (1.25)	0	0	0	2 (0.21)	2 (0.21)	0	8 (0.83)	3 (0.31)
	Combined	2.005	32 (1.60)	28 (1.40)	0	0	0	7 {0.35)	2 (0.10)	0	18 (0.90)	3 (0.15)
Bear Cr.	1	1.240	29 (2.34)	4 (0.32)	0	0	0	17 (1.37)	0	0	12 (0.97)	25 (2.00)
	2	994	27 (2.72)	12 (1.21)	0	0	0	0	0	0	7 (0.70)	2 (0.20)
	Combined	2.234	56 (2.51)	16 (0.72)	0	0	0	17 (0.76)	0	0	19 (0.85)	27 (1.21)
Moose Cr.	1	914	16 (1.75)	10 (1.10)	7 (0.76)	1 (0.11)	0	2 (0.22)	0	0	12 (1.31)	55 (6.00)
	2	640	7 (1.09)	3 (0.47)	2 (0.31)	0	0	1 (0.16)	0	0	4 (0.63)	1 (0.16)
	Combined	1.554	23 (1.48)	13 (0.84)	9 (0.58)	1 (0.06)	0	3 (0.19)	0	0	16 (1.02)	56 (3.60)
Big Canyon Cr.	1	165	6 (3.64)	10 (6.10)	6 (3.60)	1 (0.60)	1 (0.60)	0	1 (0.60)	0	0	0

[a] RB-SH=rainbow-steelhead.

[b] chinook salmon.

[c] Dolly Varden trout.

[d] brook trout.

[e] cutthroat trout.

[f] whitefish.

Appendix A. Creel census summary for lakes and reservoirs in Region 2, 1987.

Lakes and reservoirs	Month	Anglers	Fish caught[a]									Hour	Fish/hour	Fish/angler
			HRB	KOK	CT	BK	DV	B	BC	SB	LB			
Dworshak Reservoir	Jan	6	2									5	0.4	0.3
	Mar	30	42	12								97	0.6	1.8
	Apr	4										6	0.0	0.0
	May	27	9	74								113	0.7	3.1
	Jun	110	6	64								250	0.3	0.6
	Aug	18	1	9								63	0.2	0.6
Winchester Lake	Jan	38	71									85	0.8	1.9
	Feb	4										10	0.0	0.0
	Apr	144	245					9				266	0.9	1.8
	May	262	374					135				541	0.9	1.9
	Jun	149	121					208				280	1.2	2.2
	Jul	161	139					41				219	0.8	1.1
	Aug	120	116					82				196	1.0	1.6
	Sep	84	97					71			1	156	1.1	2.0
	Oct	62	130					2				100	1.3	2.1
Spring Valley Reservoir	Apr	160	376								2	311	1.2	2.4
	May	166	335								12	335	1.0	2.1
	Jun	150	192								9	258	0.8	1.3
	Jul	52	91								2	100	0.9	1.8
	Aug	26	30								7	54	0.7	1.4
	Sep	19	26								6	32	1.0	1.7
	Oct	34	137									45	3.0	4.0
Manns Lake	Apr	83	169					3				123	1.4	2.1
	May	111	148									193	0.8	1.3
	Jun	57	76									90	0.8	1.3
	Jul	52	130					10				98	1.4	2.7
	Aug	44	53					18				88	0.9	1.8
	Sep	42	90									98	0.9	2.1
	Oct	26	57					20				39	2.0	3.0
	Nov	8	16									15	1.1	2.0

Appendix A. Continued.

Lakes and reservoirs	Month	Anglers	Fish caught[a]									Hours	Fish/hour	Fish/angler
			HRB	KOK	CT	BK	DV	B	BC	SB	LB			
Soldiers Meadow Reservoir	Apr	52	60									69	0.9	1.1
	May	46	111									94	1.2	2.4
	Jun	42	98									116	0.8	2.3
	Jul	77	167									181	0.9	2.2
	Aug	31	52									50	1.0	1.7
	Sep	19	38									41	0.9	2.0
	Oct	4	6									4	1.5	1.5
Waha Lake	Apr	3	10									13	0.8	3.3
	May	13	9							5		17	0.8	1.1
	Jun	2	3									5	0.6	1.5
	Jul	2										1	0.0	0.0
	Aug	9	22									22	1.0	2.4
	Sep	10	14									11	1.3	1.4
	Oct	4	4									3	1.3	1.0
	Nov	2	6									8	0.8	3.0
Moose Creek Reservoir	Apr	42	109					3			1	107	1.1	2.7
	May	41	91									93	1.0	2.2
	Jun	54	44					1			3	108	0.4	0.9
	Jul	3	12									11	1.1	4.0
	Oct	3	18									3	6.0	6.0
Elk Creek Reservoir	Apr	33	39			13						137	0.4	1.6
	Jun	6	16									13	1.2	2.7
	Jul	5	6									8	0.8	1.2
	Aug	2	4									4	1.0	2.0
Blue Lake	Apr	5	17									11	1.5	3.4
	May	9	15									16	0.9	1.7
	Jun	6	6									3	2.0	1.0
	Jul	1										1	0.0	0.0
Campbells Pond	Apr	33	38									65	0.6	1.2
	May	11	10									22	0.4	0.9

[a]HRB=hatchery rainbow trout, KOK=kokanee, CT=cutthroat trout, BK=brook trout, DV=Dolly Varden trout, B=bullhead, BC=black crappie, SB=smallmouth bass, LB=largemouth bass.

Appendix B. Creel census summary for rivers and streams in Region 2, 1987.

Rivers and streams	Month	Anglers				Species harvested[a]							Hours	Fish/ hour	Fish/angler
		Res.	NR	WRB	HRB	SH	CT	BK	DV	WF	SB	CC STG			
South Fork Clearwater	May	62	11	30		104[S]	7	4	4	1			149	1.0	2.0
	Jun	15	9		6		2		2				32	0.3	0.4
Red River	Jul	26	2		7	4[S]	3		2				32	0.5	0.6
Crooked River	Aug	2				6[S]							2	3.0	3.0
Newsome Creek	May	16		11		28[S]	4			2			47	1.0	2.8
	Jun	5			8								7	1.1	1.6
Selway River															
Mouth to falls (C-K)	Jun	26	8		15		5		1	1			48	0.4	0.6
Gedney Creek	Jun	3			13								5	2.6	4.3
Lochsa River															
Mouth to Wilderness Gateway (C-K)	Jun	33	4	14	22		5		1				50	0.8	1.1
Middle Fork Clearwater	Jun	2								1			2	0.5	0.5
North Fork Clearwater															
Above Dworshak Reservoir	May	43	2	7			29		10	7			64	0.8	1.2
	Jun	14		2			2						9	0.4	0.3
	Jul	14	4	12			10		2	7			37	0.8	1.7
Orogrande Creek	May	18	3	15				4	1				16	1.3	1.0
Skull Creek	May	4		1			2						4	0.8	0.8
Lake Creek	Jul	1											1	0.0	0.0
Clearwater River	Jun	20	4			36[S]					1		34	1.1	1.5
	Jul	64	14			81[S]							114	0.7	1.0
	Aug	15	7			25[S]							36	0.7	1.1
	Sep	36				13[A]							61	0.2	0.4
Quartz Creek	Jun	2			3			3					6	1.0	3.0
Lawyers Creek	Apr	17			10								6	1.7	0.6

Appendix B. Continued.

Rivers and streams	Month	Anglers				Species harvested[a]								Hours	Fish/ hour	Fish/angler
		Res.	NR	WRB	HRB	SH	CT	BK	DV	WF	SB	CC	STG			
Snake River	Jan	17	3			10[A]								62	0.2	0.5
	May	59	24		22						126	4	19[R]	282	0.6	2.1
	Jun	25	2			54[S]								38	1.4	2.0
	Jul	50	44		46						26	1	1[R]	140	0.5	0.8
	Aug	21	27		53						18		3[R]	124	0.6	1.5
	Dec	12	5			7[A]								36	0.2	0.4
Salmon River	Feb	11				4[A]								55	0.1	0.4
	May	2	1											2	0.0	0.0
Little Salmon	May	21				39[S]								29	1.3	1.8
Slate Creek	May	1	2	3					1					5	0.8	1.3
Crooked Creek	May	6			8		1							13	0.7	1.5
Big Creek	Aug	7	1	8										16	0.5	1.0

[A] Adult.

[R] Released.

[S] Smolt.

[a] WRB=Wild rainbow trout, SH=steelhead, CT=cutthroat trout, BK=brook trout, DV=Dolly Varden trout, WF=whitefish, SB=smallmouth bass, CC=channel catfish, and STG=sturgeon.

Appendix C. Comparison of densities of juvenile salmon and steelhead in selected Region 2 streams, 1985, 1986 and 1987.

Stream	Year	Transect number	Number/100 m^2 Rainbow-steelhead 0	1	2	>3	Chinook 0	1
Captain John	1985	1	5.0	6.9	2.8	0.3	0.0	0.0
	1986	1	26.6	19.1	2.2	0.0	3.8	0.0
	1987	1	17.8	10.3	0.9	0.0	0.0	0.0
	1985	2	11.7	10.6	5.0	0.0	0.0	0.0
	1986	2	17.7	23.8	5.5	0.6	0.0	0.0
	1987	2	15.0	10.0	1.7	1.7	0.0	0.0
Wolf	1985	1	34.8	9.6	7.9	1.5	0.0	0.0
	1986	1	127.0	9.9	1.4	0.0	0.0	0.0
	1987	1	55.3	9.9	5.7	0.0	0.0	0.0
Sheep	1985	1	13.9	5.7	15.6	3.3	0.0	0.0
	1986	1	6.8	13.5	15.8	9.0	0.0	0.0
	1987	1	26.3	12.0	15.8	11.3	0.0	0.0
	1985	2	3.6	3.8	2.8	0.4	0.0	0.0
	1986	2	2.7	4.5	2.5	1.2	0.0	0.0
	1987	2	1.4	3.9	1.0	0.2	0.0	0.0
Granite	1985	1	10.5	14.0	2.2	0.0	0.0	0.0
	1986	1	3.3	7.6	5.2	0.9	0.0	0.0
	1987	1	15.2	6.2	6.2	1.4	0.0	0.0
	1985	2	6.1	15.3	3.5	0.0	0.0	0.0
	1986	2	10.3	7.7	1.3	0.0	0.0	0.0
	1987	2	16.0	5.8	3.8	1.3	0.0	0.0
	1985	3	7.5	6.5	6.0	1.5	0.0	0.0
	1986	3	5.5	14.5	8.5	7.5	0.0	0.0
	1987	3	0.0	4.5	3.5	5.0	0.0	0.0
Big Canyon	1985	1	0.0	6.7	0.3	0.6	0.0	0.6
	1986	1	24.8	7.9	0.6	0.6	0.0	0.0
	1987	1	3.6	6.1	3.6	1.2	0.0	0.0
Tenmile	1985	1	6.1	1.7	4.4	0.2	0.0	0.0
	1986	1	1.9	2.5	0.8	0.5	35.5	0.0
	1987	1	1.6	0.6	1.3	0.6	0.1	0.0
Newsome	1985	1	83.8	5.0	5.0	0.8	0.0	0.0
	1986	1	12.4	55.8	1.8	0.0	105.3	0.0
	1987	1	3.9	2.1	0.0	0.0	0.3	0.0

Appendix C. Continued.

Stream	Year	Transect number	Number/100 m^2					
			Rainbow-steelhead				Chinook	
			0	1	2	>3	0	1
White Cap	1985	1	1.1	0.0	1.1	0.0	0.0	0.0
	1986	1	0.3	1.4	0.3	0.0	0.8	0.0
	1987	1	ND	ND	ND	ND	ND	ND
	1985	2	0.0	0.1	0.6	0.0	0.8	0.1
	1986	2	0.0	0.0	0.0	0.0	0.1	0.0
	1987	2	ND	ND	ND	ND	ND	ND
Running	1985	1	2.8	0.7	0.0	0.2	0.0	0.9
	1986	1	2.2	0.7	0.0	0.0	1.6	0.0
	1987	1	1.8	1.5	0.0	0.0	0.5	0.0
	1985	2	2.5	1.6	0.3	0.0	0.0	0.0
	1986	2	1.4	0.3	0.0	0.0	0.2	0.0
	1987	2	1.4	1.3	0.0	0.0	0.2	0.0
Bear	1985	1	ND	ND	ND	ND	ND	ND
	1986	1	0.9	0.5	0.0	0.0	3.3	0.0
	1987	1	2.3	0.3	0.0	0.0	1.4	0.0
	1985	2	ND	ND	ND	ND	ND	ND
	1986	2	2.9	0.2	0.0	0.0	1.0	0.0
	1987	2	2.7	1.2	0.0	0.0	0.0	0.0
Moose	1985	1	1.6	0.1	0.0	0.0	0.0	0.0
	1986	1	ND	ND	ND	ND	ND	ND
	1987	1	1.8	1.1	0.8	0.1	0.2	0.0
	1985	2	4.8	2.0	1.7	0.5	0.5	1.7
	1986	2	ND	ND	ND	ND	ND	ND
	1987	2	1.1	0.5	0.3	0.0	0.2	0.0

JOB PERFORMANCE REPORT

State of: Idaho

Name: REGIONAL FISHERY MANAGEMENT INVESTIGATIONS

Project No.: F-71-R-12

Title: Region 2 Technical Guidance

Subproject No.: 2-d

Period Covered: July 1, 1987 to June 30, 1988

ABSTRACT

During 1987, Region 2 fishery management personnel provided private individuals, organizations and state and federal agencies with written technical guidance and advice on projects associated with, or having impact, on the fishery resource or aquatic habitat in Region 2. Written comments were submitted on a total of 96 documents. In addition, farm pond owners were assisted in selecting and obtaining fish to be stocked into their ponds.

Author:

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OBJECTIVES

1. To provide technical guidance to public agencies and individuals regarding stream alterations, timber sales, road construction, small hydro projects, private pond operations, or any other matters pertaining to fisheries in Region 2.

2. To assist local sportsmens' groups and individuals with habitat improvement projects that benefit fisheries.

RECOMMENDATION

1. Continue the technical guidance program to ensure professional and timely input regarding projects and programs that affect Region 2 fisheries.

TECHNIQUES USED

By personal contacts, field inspections, and project and document reviews, we gave comments and advice for projects, or activities, associated with, or impacting, the fishery resource or aquatic habitat of the Region.

FINDINGS

During 1987, Region 2 fishery management personnel submitted written comments on 96 documents from 9 separate state and federal agencies, comprising 15% of the 648 that received comment statewide. Table 1 categorizes these comments by agency.

Table 1. Summary of documents receiving written comments from Region 2 fishery management, 1987.

Agency	Number of documents
U.S. Bureau of Land Management	4
U.S. Corps ofEngineers	5
U.S. Forest Service	11
U.S. Environmental Protection Agency	9
Idaho Department of Lands	14
Idaho Department of Health & Welfare	1
Idaho Department of Transportation	10
Idaho Department of Water Resources	38
Miscellaneous	4
TOTAL =	96

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